

Study finds perception of food available to mother can affect birthweight in mice

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While studies have shown that what a mother eats during pregnancy can affect her offspring, it could be that what she sees others eating can also affect her offspring. New research from the University of Alabama at Birmingham School of Public Health explores the influence it has in a new mouse study.

"We wanted to know how perception of the food environment (seeing, hearing and smelling others' eating high-calorie foods rather than actually eating high-calorie foods themselves) would play into reproductive outcomes," said Tonia Schwartz, Ph.D., postdoctoral fellow in the UAB Office of Energetics, of findings published in the journal *Obesity*.

To test this, researchers let mice grow up on a "cafeteria diet," which includes chocolate, nacho chips, pepperoni and sugary cereals, for example. The mice were then switched to a standard low-fat mouse chow and assigned to two treatments: Either they lived with a cage-mate who was still eating the cafeteria diet so that they could hear, see and smell but could not [eat](#) (the treatment) or they lived with a cage-mate who was eating the same standard mouse chow (the control). Male subjects were then introduced for breeding.

"We found that living with a cage-mate who was eating the cafeteria diet caused the mice to produce smaller pups (about 15 percent smaller) with less fat than the controls whose cage-mates were eating the same diet as themselves," Schwartz said. "We also saw an interesting tentative finding for the treatment to cause more miscarriages, although this was not statistically significant."

Schwartz points out the one surprising outcome of the study: The treatment did not affect the weight or fat mass of the mother mice.

"Based on previous studies' results, we had predicted that the treatment would cause the adult females to gain fat; but we did not see this effect," Schwartz said. "We had no predictions as to how it would affect reproduction, so it was surprising to see such a strong effect."

These results, Schwartz says, suggest that the perception of the social food environment, not just what is actually eaten, may have an effect on

physiology and reproduction that can translate to the next generation.

"Both people and mice are social animals, and our results indicate that, at least in mice, aspects of the social environment around eating can have important effects on physiology above and beyond the actual food consumed," Schwartz said.

Even though it was an exciting finding, Schwartz says it is very preliminary.

"These results need to be replicated and tested across species before they could be utilized in a clinical setting or be used to make recommendations to the public," Schwartz said.

David B. Allison, director of UAB's Nutrition Obesity Research Center and senior investigator on the project, said, "Animals, including us humans, are constantly 'reading' and adapting to their perceptions of their environments, and so it makes sense that our perception of the [food environment](#) may be a powerful influence on health outcomes above and beyond what we actually eat. One may speculate that the nearly ubiquitous exposure to eating stimuli in our culture may have effects on health even among persons who do not themselves overconsume."

"It is interesting to conjecture that we may have created a mouse model of the experience of disparity in our culture, which in humans is known to be associated with low-birthweight babies and greater infant mortality; but this is speculative at present," Allison said.

Schwartz, Allison and the research team are in the process of replicating this experiment in finer detail with a more powerful sample size and experimental design at UAB, and they are also testing the principal findings in fruit flies in collaboration with Scott Pletcher, Ph.D., and his lab at the University of Michigan Medical School.

Provided by University of Alabama at Birmingham

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